



Exhibit BA

CURRICULUM VITAE OF DECLARANT TIMOTHY BRAZELTON, PH.D.

Application No. 09/993,045, filed 13-Nov-2001

Inventor: Brazelton et al.

Title: Methods for Treating Disorders of Neuronal Deficiency with Bone Marrow
Derived Cells

Examiner: Q. Janice Li

Art Unit: 1632

CURRICULUM VITAE

TIMOTHY R. BRAZELTON, Ph.D.

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EDUCATION

Undergraduate	Saint Olaf College Northfield, Minnesota B.A. 1991 Majors: Biology, Chemistry
Graduate	Stanford University School of Medicine Stanford, California M.D. 2004 (expected) Ph.D. 2002 (Plasticity of adult bone marrow cells)

PROFESSIONAL EXPERIENCE

2002-present	<u>Research scientist, Baxter Laboratory for Genetic Pharmacology, Stanford, CA.</u>
2000-present	<u>Editor of Stem Cell Biology, <i>The Journal of Regenerative Medicine</i></u>
1998-2002	<u>Graduate student, Dept. Molecular Pharmacology, Stanford, CA.</u> Explored ability of adult bone marrow cells to generate diverse cell types in vivo including neurons, skeletal muscle, fibroblasts, smooth muscle cells, and various types of epithelium. Myoblast-mediated in vivo delivery of growth factors for tissue regeneration.
1996-2001	<u>Founder & Director, <i>The International Lung Transplant Database, Stanford, CA</i></u> Founded and directed the largest database of detailed lung transplant information in the world. Involves several academic centers from the U.S, Europe, and Australia. Wrote customized software which uses patient data to model and compare outcomes between competing clinical trial designs.

PROFESSIONAL EXPERIENCE (continued)

- 1996-1997 Director, Phase I FDA trials for SDZ-RAD, Stanford, CA.
Evaluated safety and pharmacokinetics of SDZ-RAD (a rapamycin derivative) in lung transplant recipients with and without cystic fibrosis.

- 1994-1997 Medical student researcher, Laboratory for Transplant Immunology, Stanford, CA. Developed and tested novel hypotheses regarding the etiology of chronic vascular and airway rejection. Explored mechanisms of action and efficacy in rodents of leflunomide as well as other novel immunosuppressive compounds.

- 1991-1992 Research assistant, Atmospheric Scientific Research Station, Whiteface Mountain, NY

- 1991 Field study supervisor, British Fisheries Service, Turks & Caicos Islands
Settlement patterns of *Panulirus argus* on South Caicos,

AWARDS, INVITED PLENARY TALKS, AND PROFESSIONAL SOCIETIES

- 2003 Invited talk, American Association of Blood Banks Annual Meeting, San Diego, CA

- 2003 Invited talk, 3rd Annual Conference on Mesenchymal and Nonhematopoietic Stem Cells, New Orleans

- 2003 Invited plenary talk, American Society for Blood and Marrow Transplantation and the International Bone Marrow Transplant Registry/Autologous Blood and Marrow Transplant Registry Tandem BMT Meeting, Keystone, CO

- 2002 Invited talk, 2nd Annual Conference on Mesenchymal and Nonhematopoietic Stem Cells, New Orleans

- 2002 Invited plenary talk, Stem Cells & Regenerative Medicine Conference, San Diego

- 2002 Invited talk, European Society of Cardiology, Berlin

- 2001 Invited plenary talk, The 7th Basic Sciences Symposium of the Transplantation Society, Bern, Switzerland

- 2000 Honorary Member, Society of Regenerative Medicine

- 1998 National Institute of Health, Five year Ph.D. training grant, Stanford University School of Medicine

- 1998 Award for Clinical Research, Western Section of the American Federation for Clinical Research, Carmel, CA.

For abstract entitled " CREATION OF A MULTINATIONAL RESEARCH DATABASE WITH INTERNET-BASED DATA COLLECTION AND MANAGEMENT, CLINICAL PREDICTION SOFTWARE, AND REMOTE ANALYSIS: A MEANS TO ACCELERATE THE DRUG DEVELOPMENT PROCESS"

1998 Best Clinical Trial Management of 1997, Novartis Pharmaceuticals

For phase I FDA trial of SDZ-RAD, Stanford Medical School

1998 Caves Award Presentation, International Society of Heart and Lung Transplantation, Chicago.

For abstract entitled " RECIPIENT MESENCHYMAL CELLS INFILTRATE AND REMODEL MEDIAL AND ADVENTITIAL TISSUE IN THE RAT FEMORAL ARTERY ALLOGRAFT MODEL OF CHRONIC VASCULAR REJECTION"

AWARDS AND PROFESSIONAL SOCIETIES (continued)

1998 Plenary Talk, International Society of Heart and Lung Transplantation, Chicago.

1998 Van Arman Award, 9th International Conference of the Inflammation Research Association, Hershey, PA.

For abstract and paper entitled "CHRONIC REJECTION: THE RESULT OF UNCONTROLLED REMODELING OF GRAFT TISSUE BY RECIPIENT MESENCHYMAL CELLS?"

1998 Member, American Society of Transplantation

1998 Member, The Transplantation Society

1998 Member, The International Society for Heart & Lung Transplantation

1997 Award for Research in Clinical Pharmacology, Western Section of the American Federation for Clinical Research, Carmel, CA, Tied for first place.

For abstract entitled "ASSESSMENT OF DHODH ACTIVITY IN WHOLE BLOOD: A POTENTIAL PHARMACODYNAMIC ASSAY TO MONITOR LEFLUNOMIDE"

1997 Caves Award Presentation, International Society of Heart and Lung Transplantation, London.

For abstract entitled "EFFICACY OF IMMUNOSUPPRESSIVE AGENTS CORRESPONDS TO THEIR ABILITY TO MAINTAIN DONOR TISSUE PHENOTYPE IN ALLOGRAFTED TRACHEAS"

1997 Plenary Talk, International Society of Heart and Lung Transplantation, London.

1997 Keynote speaker - Novartis International Workshop on Lung Transplantation Clinical Trial Design, Basel, Switzerland.

- 1997 Lutheran Brotherhood, Five year MD/PhD scholarship, Stanford Medical School
- 1996 Van Arman Award, 8th International Conference of the Inflammation Research Association, Hershey, PA, First place.
For abstract and paper entitled "REMOVAL OF ALLOIMMUNE INJURY FAILS TO PREVENT SUBSEQUENT PROGRESSION OF OBLITERATIVE AIRWAY DISEASE IN RAT TRACHEAL ALLOGRAFTS"
- 1995 Member, American Association for the Advancement of Science
- 1995 Member, American Medical Association
- 1995 Stanford Medical Scholars, Student Research Award

PUBLICATIONS

1. Brazelton, T., N. Quinn. An ecological survey of settlement sites for juvenile *Panulirus argus* on the North and West Banks of South Caicos, Turks and Caicos Islands. *J. British Fisheries Service*, 1991.
2. Reichenspurner, H. B. Adams, V. Soni, T.R. Brazelton, R. Shorthouse, B. A. Reitz, G. J. Berry, R. E. Morris. Obliterative Airway Disease After Heterotopic Tracheal Xenotransplantation in a Concordant Rodent Model: Pathogenesis and Treatment. *Transplantation Proceedings*, 28(2): 729-30, 1996.
3. Brazelton, T.R., and Morris, R. E. Molecular Mechanisms of action of new xenobiotic immunosuppressive drugs: tacrolimus, sirolimus, mycophenolate mofetil, and leflunomide. *Current Opinion in Immunology*, 8:(5) 710-20, 1996.
4. Brazelton, T.R., Cheung, A. C. Morris, R. E. "Pharmacologic Immunosuppressants in Xenografting" in *Xenografting*, edit. J. C Cooper, 1996.
5. Nair, R.V., X. Huang, R. Shorthouse, B. Adams, T. R. Brazelton, R. Braun-Dullaeus, R.E. Morris. Antiproliferative effects of rapamycin on growth-factor stimulated human adult lung fibroblasts in vitro may explain its superior efficacy for prevention and treatment of allograft obliterative airway disease in vivo. *Transplantation Proceedings* 29(1-2):614-5, 1997.
6. Cheung, A., M. Billingham, T. R. Brazelton, B. Zheng, H. Silva, R. Shorthouse, R. E. Morris. Leflunomide abrogates hyperacute rejection in presensitized rats. *Transplantation Proceedings*, 1997 Feb-Mar, 29(1-2):1294-5
7. Brazelton, T. R., B. A. Adams, A. C. Cheung, R. E. Morris. Progression of obliterative airway disease occurs despite the removal of immune reactivity by retransplantation. *Transplantation Proceedings*, 1997 Sep, 29(6): 2613.
8. Brazelton, T. R. , R. Shorthouse, X. Huang, R.E. Morris. Infiltrating recipient mesenchymal cells form the obliterative airway disease lesion and dramatically

remodel graft tissue in a model of chronic lung rejection. *Transplantation Proceedings*, 1997 Sep, 29(6): 2614.

9. Reichenspurner, H., V. Soni, M. Nitschke, G. J. Berry, T.R. Brazelton, R. Shorthouse, X. Huang, B. A. Reitz, R. E. Morris. Obliterative airway disease after heterotopic tracheal xenotransplantation. Pathogenesis and prevention using new immunosuppressive agents. *Transplantation* 64(3):373-383, 1997.
10. Reichenspurner, H., V. Soni, M. Nitschke, G.J. Berry, T.R. Brazelton, R. Shorthouse, X. Huang, J. Boname, R. Girgis, B.A. Reitz BA, R.E. Morris. Enhancement of obliterative airway disease in rat tracheal allografts infected with recombinant rat cytomegalovirus. *Journal of Heart and Lung Transplantation*, 1998 May, 17(5):439-51.
11. Segarra, T.R. Brazelton, N. Guterman, B. Hausen, W. Jacobsen, R.E. Morris, L.Z. Benet, U. Christians. Development of a high-performance liquid chromatographic-electrospray mass spectrometric assay for the specific and sensitive quantification of the novel immunosuppressive macrolide 40-O-(2-hydroxyethyl) rapamycin. *Journal of Chromatography B* 720: 179-187, 1998.
12. Brazelton, T.R., B. Adams, R. Shorthouse, and R.E. Morris. Chronic rejection: The result of uncontrolled remodeling of graft tissue by recipient mesenchymal cells? Data from two rodent models and the effects of immunosuppressive therapies. *Inflammation Research*, 48(suppl 2):S-1-S2, 1999.
13. Adams, B.A., T.R. Brazelton, G.J. Berry, R.E. Morris. The role of respiratory epithelium in a rat model of obliterative airway disease. *Transplantation*, 69(4):661-4, 2000.
14. Adams B.F., G.J. Berry, X. Huang, R. Shorthouse, T.R. Brazelton, Morris RE.. Immunosuppressive therapies for the prevention and treatment of obliterative airway disease in heterotopic rat trachea allografts. *Transplantation*, 69(11):2260-6, 2000.
15. Ikonen, T.S., T. R. Brazelton, G. J. Berry, R.S. Shorthouse, R.E. Morris. Epithelial re-growth is associated with inhibition of obliterative airway disease in orthotopic tracheal allografts in non-immunosuppressed rats. *Transplantation*, 70(6):857-63, 2000.
16. Brazelton, T.R., F.V.M. Rossi, G. Keshet, H.M. Blau. From bone marrow to brain: Adult bone marrow-derived cells give rise to neuronal phenotypes in mice. *Science*, 290:1775-9, 2000.)
17. Doyle, R.L., M.I. Hertz, J.M. Dunitz, J.E. Loyd, A.A. Stecenko, R.L. Wong, K.A. Chappell, T.R. Brazelton, J.M. Kovarik, S. Appeldingemanse, L. Dou, H.T. Smith, D. Tudor, R.E. Morris. RAD in stable lung and heart/lung transplant recipients: safety,

- tolerability, pharmacokinetics, and impact of cystic fibrosis. *Journal of Heart and Lung Transplantation*, 20:330-9, 2001.
18. Brazelton, T.R., Springer M.L., H.M Blau. Not the usual suspects: the unexpected sources of tissue regeneration. *Journal of Clinical Investigation*, 107:1355-6, 2001.
 19. Morikawa, M., T.R. Brazelton, G.J. Berry, R.E. Morris. Prolonged inhibition of obliterative airway disease in murine tracheal allografts by brief treatment with anti-LFA-1 (CD11a) monoclonal antibody. *Transplantation*, 71:1616-21, 2001.
 20. Blau, H.M., T.R. Brazelton, J.M. Weimann. The evolving concept of a stem cell: Entity or function? *Cell*, 105:829-41, 2001.
 21. Blau, H.M., T.R. Brazelton, G. Keshet, F. Rossi. Something in the eye of the beholder. *Science*, 298:361-2, 2002.
 22. Weimann, J.M., C.A. Charlton, T.R. Brazelton, R.C. Hackman, H.M. Blau. Contribution of transplanted bone marrow cells to purkinje neurons in human adult brains. *Proceedings of the National Academy of Sciences*, 100(4):2088-2093, 2003.
 23. Springer, M.L., C.R. Ozawa, A. Banfi, P.E. Kraft, T.K. Ip, T.R. Brazelton, H.M. Blau. Localized arteriole formation directly adjacent to the site of VEGF-induced angiogenesis in muscle. *Molecular Therapy*, 7(4): 441-449, 2003.
 24. Singer, L.G., T.R. Brazelton, R.L. Doyle, R.E. Morris, J. Theodore, for the International Lung Transplant Database Study Group. Weight gain following lung transplantation. *Journal of Heart and Lung Transplantation*, 22(8):894-902, 2003.
 25. Brazelton, T.R., M. Nystrom, H.M. Blau. Significant differences among skeletal muscles in the incorporation of bone marrow-derived cells. *Developmental Biology*, 262(1):64-74, 2003.
 26. Corbel, S.Y., A. Lee, L. Yi, J. Duenas, T.R. Brazelton, H.M. Blau, F.M.V. Rossi. Contribution of hematopoietic stem cells to skeletal muscle. *Nature Medicine*, 9:1528-32, 2003.
 27. Briffa N.P., R. Shorthouse, J. Chan, H. Silva, M. Billingham, T. Brazelton, R.E. Morris. Histological and immunological characteristics of, and the effect of immunosuppressive treatment on, xenograft vasculopathy. *Xenotransplantation*, 11(2):149-59: 2004.
 28. Ikonen, T., T. R. Brazelton, R. Shorthouse, N. Briffa, G.J. Berry, R.E. Morris. Epithelial regrowth inhibits obliterative airway disease in acutely rejected heterotopic tracheal allografts in non-immunosuppressed rats. (submitted, *Journal of Clinical Investigation*)

29. Nitschke, M., H. Reichenspurner, T. R. Brazelton, B. Adams, R. Shorthouse, G. Berry, E. Mocarski, R. E. Morris. Prevention and treatment of rat-cytomegalovirus infection and its influence on development of obliterative airway disease in rat tracheal allografts using HPMPC: A new antiviral analog. (submitted, *International Journal of Heart and Lung Transplantation*).
30. Singer, L.G., T.R. Brazelton, R.E. Morris, R.L. Doyle, J. Theodore. Cytomegalovirus Infection and Idiopathic Pulmonary Fibrosis. (submitted, *CHEST*).
31. Brazelton, T. R., R.L. Doyle, C. Poirier, R.L. Wong, R.D. Newmark, T. Lin, B.A. Reitz, J. Theodore, R.E. Morris. Risks for BOS1 and Obliterative Bronchiolitis: Multivarariate Regression Analysis of 826 Transplants from 12 centers in the U.S., Europe and Australia. (in preparation)

COMMISSIONED REPORTS

1. T.R. Brazelton, C. Bush, R.D. Newmark, R.L. Wong, R.E. Morris. Outcome estimates from proposed RADB 159 protocols with a patients being enrolled at the time of qualification. December, 1997.
2. T.R. Brazelton, C. Bush, R.D. Newmark, R.L. Wong, R.E. Morris. Outcome estimates from proposed RADB 159 protocols using existing patient data from the U.S., Europe, and Australia. December, 1997.
3. T.R. Brazelton, R.L. Doyle, C. Poirier, R.L. Wong, R.D. Newmark, T. Lin, B.A. Reitz, J. Theodore, R.E. Morris and the Stanford Lung Database Group, the International Lung Transplant Study Group#, and Novartis Pharmaceuticals. The International Lung Transplant Database: White Paper. February, 1998.
 # Alfred Hospital, Victoria, Australia
 Cedars-Sinai Medical Center, Los Angeles, CA, USA
 Cleveland Clinic, OH, USA
 College of Physicians and Surgeons of Columbia University, NY, USA
 Duke University Medical Center, Durham, NC, USA
 Hannover Medical School, Germany
 Loyola University Medical Center, Chicago, IL, USA
 Papworth Hospital, Cambridge, UK
 University of Pittsburgh Medical Center, PA, USA
 Saint Vincent's Hospital, Darlinghurst, NSW, Australia
 Stanford Medical Center, Palo Alto, CA, USA
 University of California - San Francisco Medical Center, USA
4. T.R. Brazelton, R.L. Doyle, C. Poirier, R.L. Wong, R.D. Newmark, T. Lin, B.A. Reitz, J. Theodore, R.E. Morris. Risks for BOS1 and Obliterative Bronchiolitis: Multivarariate Regression Analysis of 826 Transplants. 118 pages. February, 1998.

COMMISSIONED REPORTS (continued)

5. T.R. Brazelton, C. Bush, J. Hagenkord, R. Kupaswami, K. Kudsman, R.D. Newmark, R.L. Wong, R.E. Morris. Recommendations to modify inclusion and exclusion criteria for de novo studies in lung transplant recipients: A means to improve both enrollment and outcomes. March, 1998.
6. T.R. Brazelton, R.D. Newmark, R.L. Wong, R.E. Morris. Differential risk of acute rejection events during different periods post transplant. 97 pages. March, 1998.
7. T.R. Brazelton, C. Bush, R.L. Wong, R.E. Morris. Implications of various enrollment and exclusion criteriae for clinical lung transplant trials designed to test the ability of novel therapies to prevent chronic rejection utilizing existing patient pools. Results of computerized modeling with data from the *International Lung Transplant Database*. Part 1 36 pages. April, 1998.
8. T.R. Brazelton C. Bush, R.L. Wong, R.E. Morris. Implications of various enrollment and exclusion criteriae for clinical lung transplant trials designed to test the ability of novel therapies to prevent chronic rejection utilizing existing patient pools. Results of computerized modeling with data from the *International Lung Transplant Database*. Part 2. 30 pages. June, 1998.
9. T.R. Brazelton, J. Hagenkord, R. Kupaswami, C. Bush. Effects of using FEV1 as an primary outcome to monitor progression of chronic lung rejection: Computerized modeling with 826 lung transplant recipients. June, 1998.
10. T.R. Brazelton, R.E. Morris. Multivariate Risks for Survival in 826 Lung Transplant Recipients. 138 pages. July, 1998.
11. T.R. Brazelton Natural history of Bronchiolitis obliterans syndrome. 38 pages. October, 1998.
12. T.R. Brazelton Natural histories of acute rejection, graft loss, and death: Implications and recommendations for the design of drug efficacy trials with *de novo* enrollment. 57 pages. November, 1998.
13. T.R. Brazelton, C. Bush. Comparison of final proposed enrollment groups for RADB 159. 5 pages. December, 1998.
14. T.R. Brazelton Natural history of the recovery of pulmonary function following lung transplantation: Baseline predictions for clinical trials. 72 pages. December, 1998.
15. T.R. Brazelton Factors associated with increased incidences of acute rejection, graft loss, or death by post-transplant period: Implications for multicenter clinical trials in lung transplantation. 21 pages. January, 1999.

16. T.R. Brazelton Factors affecting the rate and/or magnitude of pulmonary function recovery following lung transplantation. 18 pages. January, 1999.
17. T.R. Brazelton Incidence of infectious and malignant complications following lung transplantation and associated risk factors. 14 pages. January, 1999.

ORAL PRESENTATIONS

- 1996 13th Annual Stanford Medical School Research Symposium, Stanford, CA
- 1996 8th International Conference of the Inflammation Research Association, Hershey, PA.
- 1996 XVI International Congress of the Transplantation Society, Barcelona, Spain.
- 1996 4th International Workshop on the mode of action of leflunomide, Eltville, Rhein, Germany.
- 1996 2nd International Congress on Lung Transplantation, Paris.

ORAL PRESENTATIONS (continued)

- 1996 Sixth International Alexis Carrel Conference on Graft Atherosclerosis and Chronic Rejection, Banff, Alberta, 1996 (2 presentations).
- 1997 17th Annual Meeting of the International Society for Heart and Lung Transplantation, London (3 presentations)
- 1997 3rd Loma Linda International Conference on Pediatric Heart and Lung Transplantation, Rancho Mirage, CA.
- 1977 Western Section of American Federation for Clinical Research, Carmel, CA.
- 1977 16th Annual Meeting of the American Society of Transplant Physicians, Chicago (3 presentations).
- 1997 14th Annual Stanford Medical School Research Symposium, Stanford, CA.
- 1997 Keynote speaker, Novartis Workshop on Clinical Lung Transplantation, Basel, Switzerland.
- 1998 Annual Meeting of the International Society for Heart and Lung Transplantation, Chicago (3 presentations).
- 1998 Keynote speaker, International Lung Transplant Study Group Annual Meeting, Chicago.

- 1998 RAD159 Investigator Meeting, Chicago.
- 1998 American Thoracic Society, Chicago.
- 1998 17th Annual Meeting of the American Society of Transplant Physicians, Chicago, IL
- 1998 Western Section of American Federation for Clinical Research, Carmel, CA
- 1998 XVII International Congress of the Transplantation Society, Montreal.
- 1998 9th International Conference of the Inflammation Research Association, Hershey, PA
- 1999 19th Annual Meeting of the International Society for Heart and Lung Transplantation, San Francisco, 1999 (3 presentations)
- 2000 20th Annual Meeting of the International Society for Heart and Lung Transplantation, Osaka, Japan (2 presentations)
- 2001 Seventh Basic Sciences Symposium of the Transplantation Society, Thun Switzerland
- 2002 Invited plenary talk, European Society of Cardiology, Berlin
- 2002 Invited plenary talk, Stem Cells & Regenerative Medicine Conference, San Diego
- 2002 Invited plenary talk, 2nd Annual Conference on Mesenchymal and Nonhematopoietic Stem Cells, New Orleans
- 2003 Invited plenary talk, American Society for Blood and Marrow Transplantation and the International Bone Marrow Transplant Registry/Autologous Blood and Marrow Transplant Registry Tandem BMT Meeting, Keystone, CO
- 2003 Invited talk, American Association of Blood Banks, San Diego, CA
- 2003 Invited plenary talk, 3rd Annual Conference on Mesenchymal and Nonhematopoietic Stem Cells, New Orleans

ACADEMIC SERVICE

- 1994-present Reviewer for *Cell*, *Circulation*, *Circulation Research*, *Current Opinion in Immunology*, *Development*, *Development and Disease*, *Developmental Cell*, *The Journal of Regenerative Medicine*, *EMBO*, *Experimental Hematology*, *Graft*, *Journal of Cell Biology*, *Journal of Clinical Investigation*, *Journal of Experimental Medicine*, *Journal of Heart and Lung Transplantation*, *Nature*, *NEJM*, *Science*, and *Transplantation*
- 1998 LCME re-accreditation subcommittee on basic science departments
- 1995-1999 Student representative, Medical admissions committee
- 1995-1998 Medical student rep. on Graduate Committee on Student Health

Atty. Dkt. No. SUPP-P01-016

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1995-1997	Director of Grants and Funding, Arbor Free Medical Clinic, Palo Alto, CA
1994-1996	American Medical Association Medical Student Rep., Stanford